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to be identical with European *H. fallax* var. *spinifolium*, we should be inclined, in view of the confusion about these species in this country, to withhold judgment until actual comparison of the types is made.

EDWARD B. CHAMBERLAIN

REVIEW

Hepatics of Iberia (Spain and Portugal)

A. CASARES-GIL: FLORA IBERICA. BRIOFITAS, PRIMERA PARTE. HEPATICAS. [Pp. 775, about 400 figures (half-tones of well executed original drawings), and 4 colored plates.] Mus. Nacional de Ciencias Naturales, Madrid. 1919. [In Spanish.]

This first comprehensive work on the Hepatics of the Iberian peninsula is well published as to illustrations and general typography. The Prologue and General Introduction of several pages is followed by 174 pages of general treatment of more than twenty topics, such as Characters differentiating Hepatics from Mosses, Cells, Protonema, Frond and Thallus, Rhizoids, Vegetative and Growing Points, Branching, etc. Ecology and Geographic Distribution here take up about 40 pages, treating of the relation of hepatics to substratum, humidity, latitude, and temperature, and, finally, 9 pages are devoted to Collection, Study, and Preservation of Specimens.

In the descriptive part of the book Schiffner (Engler & Prantl: Natuerlichen Pflanzenfamilien) is followed pretty closely and many species are included which have not yet been reported in Spain or Portugal, e. g., *Neesiella rupestris*.

Apparently new combinations are: *Calycularia Flotowiana* (Nees), (*Pallavicinia Flotowii* Lindb.); *Haplozia Muelleriana* (Schiffn.), (*Nardia Muelleriana* Schiffn.); *Haplozia paroica* (Schiffn.), (*Nardia paroica* Schiffn.); *Haplozia subelliptica* (Lindb.), (*Nardia subelliptica* Lindb.).

Among the generally less familiar combinations it may be noted that *Pallavicinia hibernica* and *P. Blythii* are treated under *Calycularia*; *Nardia compressa*, *N. Breidleri*, *N. scalaris*, and *N. Geoscyphus* are under the genus *Alicularia*; *N. hyalina*, *N. obovata*, *N. crenulata*, and *Jungermannia caespiticia*, *J. sphaerocarpa*, *J. cordifolia*, *J. riparia*, *J. atrovirens*, *J. pumila*, *J. Schiffneri*, and *J. lanceolata* are placed in *Haplozia*; *Jamesoniella autumnalis* D. C. [p. p.] is here *subapicalis* (Nees) Schiffn.; *Sphenolobus minutus*, *S. exsectus*, and *S. exsectaeformis* are under *Lophozia*; *Lophozia attenuata* is treated as *L. gracilis* (Schleich.) Steph.; *L. Baueriana* Schiffn. is used instead of *Jungermannia Hatcheri* Evans (?); *J. Hornschuchiana* is treated as a synonym of *L. bantryensis* (Hook.) Steph.; *Pedinophyllum interruptum* is placed under *Plagiochila*; *Mylia Tylori* and *anomala* are under *Leioscyphus*; *Chiloscyphus rivularis*, *fragilis*, and *pallescens* are treated as varieties of *C. polyanthus*; *Cephalozia byssacea* is put under *C. Starkei* (Funck) Schiffn., with a variety *papillosa* (*C. papillosa*), and *C. bifida* becomes here *C. rubella* (Nees) Warnst; *Cephalozia curvifolia* is treated

under *Nowellia*; *Odontoschisma elongatum* is a variety of *O. denudatum*; *Calypogeia fissa*, *suecica*, and *sphagnicola* are retained as varieties of *C. trichomanis*; *Bazzania trilobata* and *Pearsoni* are placed under *Pleurochisma*, and *Porella laevigata*, *platyphylla*, and *rivularis* under *Madotheca*. *Bazzania tricrenata* is listed as a synonym of *Pleurochisma triangulare* (Schleich.) Loeske, and *Porella pinnata* is under *Madotheca porella*. *Lejeunea cavifolia* is treated under *Eulejeunea*. Schiffner is followed in regarding Huebener's *Jungermannia catenulata* (*Cephalozia catenulata* Spruce) as not different from *Cephalozia reclusa* (Tayl.) Dum.

In citations it is to be noted that DeNotar is uniformly given for DeNotaris, and D. C. is used for DeCandolle.

Altogether there are described, or at least critically discussed, 329 species, quite a large proportion of which also occur in North America. Both as to figures and descriptions this manual should prove useful as a reference book even for the hepatics of the United States.

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MISCELLANEOUS NOTES

Course on Bryophytes offered at Michigan Biological Station.—

Dr. George E. Nichols writes that last summer he conducted a course at the University of Michigan Biological Station on the Taxonomy of the Bryophytes and expects to give the course again this coming summer. The Station is located on a tract of 3200 acres of land owned by the University of Michigan and is located between Douglas and Burt Lakes about 17 miles south of the Straits of Mackinac. Despite unfavorable first impressions, Dr. Nichols found the region bryologically quite rich. Not all collections are yet identified but, up to date of writing, he had named 56 liverworts, 15 sphagnums (plus several varieties), and 130 mosses. These specimens include about 90 species not before recorded from Michigan.

O. E. J.

Fossombronia cristula, Life History of. Arthur W. Haupt. Bot. Gaz. 69: 318-331. 4 pls. April, 1920. The vegetative body is a minute creeping branched thallus with two dorsal rows of genuine leaves. Monoecious, with sex organs in the axils of leaves, and antheridia and archegonia may occur in the same axil. In the archegonium the cover cell is inactive; 6-8 neck canal cells are formed; and the venter is two cells thick before fertilization. The calyptra becomes 3-4 cells thick. The sporophyte is primitive; the sporogenous tissue is differentiated early; and the elaters are rudimentary, each being homologous with a single mother-cell and not with a row of them. The mature capsule is globular or nearly so and its wall is invariably two cells thick and bears rudimentary annular and half-ring fibers on the cell-walls of the inner layer. The material studied was found by the author in cracks on fine wet deposits of silt on the bottom of an almost extinct lake in the Dune Park region in northern Indiana.

O. E. J.